

- indecisus* Peck §
inflexus Peck †
innixus Peck *
luridus Schaeff.*
luteus L. †
n. innato-olivaceus Frost *
mutabilis Morg.*
Morgani Peck *
nebulosus Peck §
nigrellus Peck *
ornatipes Peck *
pallidus Frost †
parasiticus Bull.*
piperatus Bull.*
Pocono Schw. †
purpureus Fr. §
radicans Pers. §
retipes B. & C. §
Russelli Frost *
rubropunctus Peck §
satanus Lenz §
scaber Fr.*
- separans* Peck *
sordidus Frost *
speciosus Frost §
spectabilis Peck §
subaureus Peck §
subluteus Peck †
subsanguineus Peck §
subtomentosus L. †
subvelutipes Peck §
variegatus Swartz §
variipes Peck §
versipellis Fr. †
Boletinus cavipes (Opat.) Kalch. §
paluster (Peck) Peck §
pictus (Peck) Peck §
porosus (Berk.) Peck *
Fistulina hepatica (Huds.) Fr.*
firma Peck *
Strobilomyces strobilaceus (Scop.)
 Berk.*
floccopus (Vahl) Sacc.*

B. inflexus has thus far been reported only from Pennsylvania. The species reported by Schweinitz in his Synopsis are included in Peck's Boleti of the United States.

KITTANNING, PA.

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RECENT CONTRIBUTIONS TO OUR KNOWLEDGE OF PALEOZOIC SEED-PLANTS ||

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Undoubted seeds of a gymnospermous character have long been known in considerable abundance as low down in the geo-

* In writer's collection, Carnegie Museum, Pittsburgh.

† Peck, Boleti of the United States.

‡ Herbst, Fungal Flora of the Lehigh Valley.

§ McIlvaine, One Thousand American Fungi.

|| Read before the Torrey Botanical Club, November 30, 1904.

logical scale as the Devonian, and by the Carboniferous they are very numerous in some localities, the coal-measures of both hemispheres furnishing them in considerable variety.

Little beyond descriptions based on external form are known of the seeds from American localities, where their preservation is poor as compared with the beautifully silicified and calcified remains from some of the European localities.

Brongniart as recently as 1881 * may be said to have laid the foundation for their scientific study.

In the light of the recent work, principally of Professors Oliver and Scott, the further study of these and similar remains assumes a special importance, and my excuse for this notice is the arrival in this country of the completed memoir of the above authors on the seed *Lagenostoma Lomaxi*,† which is thus far the most interesting as well as the best known fossil seed.

The fact of its definite reference to the plant which bore it is no little credit to the sagacity of the authors and to the methods of study inaugurated by the late Professor Williamson. The present memoir, which is well illustrated by seven plates and two text figures, sets forth in detail the structure of the seed and its cupule. The authors have handled all the extant material known, and their conclusions are admirable and convincing. They propose for this and similar fern-like spermatophytes a new class, the Pteridospermeae, for which Ward ‡ would establish the sub-kingdom Pteridospermaphyta in the anticipation, already partially verified, that the three great phyla of Paleozoic cryptogams independently acquired the seed habit.

The preliminary contribution of Oliver and Scott was read before the Royal Society in May, 1903, and in the short interval since we are able to record numerous contributions along the same lines. Since Potonié in 1897 established the order Cycadofilicales it has seemed probable that numerous forms of *Alethopteris*, *Pecopteris*, *Odontopteris*, *Neuropteris*, *Sphenopteris*, etc., were

* Brongniart, Adolphe. Recherches sur les graines fossiles silicifiées.

† Oliver, F. W., and Scott, D. H. On the Structure of the Palaeozoic Seed *Lagenostoma Lomaxi*. Phil. Trans. Roy. Soc. Lond. B. 197: 193-247. pl. 4-10. 17 Au 1904.

‡ Ward, L. F. Science, II. 20: 25, 279. 1904.

referable to this group rather than to the Filicales, the direct evidence for which has been slow in coming to light.

Before the publication of the final results of Messrs. Oliver and Scott, however, Kidston* announced the discovery of rhabdocarpous seeds on the rachis of *Neuropteris heterophylla*, a member of the Medulloseae, adding confirmation to the suspicion that the seeds known as Trigonocarpons were referable to this family of the Cycadofilicales.†

Following Kidston's discovery we find Grand'Eury‡ in March of this year and again in July, arguing before the French Academy the probability of the reference of certain of the silicified seeds from St. Etienne to various Filicean species.

In March we have further comments by Zeiller§; and Renault|| in May reports his conviction that the seed *Stephanospermum* from Autun belongs to *Calamodendron* or *Arthropitys*. We learn further from Oliver and Scott's memoir that Arber is about to describe a fossil in which numerous *Lagenostoma*-like seeds are supposed to belong to a *Sphenopteris* frond.

With regard to the microsporangial apparatus of these various plants we know little beyond the suggestive work of Miss Benson¶ on *Telangium*, which she regards as the microsporangial synangium of *Lyginodendron*. We are on safe ground in the assumption that in each of the three great cryptogamic phyla of the Paleozoic the seed habit was at least approximated, *i. g.*, among the fern-like plants we have positive proof in the case of

* Kidston, R. Proc. Roy. Soc. Lond. 72: 487. D 1903.

Oliver, F. W. New Phytologist, 4: 32. 1904.

Kidston, R. Philos. Trans. Roy. Soc. Lond. B. 197: 1-5. 1904. [Illust.]

† Wild. On *Trigonocarpon olivaeforme*. Trans. Manchester Geol. Soc. 16. 1900.

Scott, D. H. On the Origin of Seed-bearing Plants. Roy. Inst. May 15, 1903.

Oliver, F. W. Notes on *Trigonocarpus*, etc. New Phytologist, 3: 96-104. *Pl.* 2. 1904.

‡ Grand'Eury. Sur les rhizomes et les racines des Fougères fossiles et des Cycadofilices. Compt. rend. 138: 607-610. 1904.

Grand'Eury. Sur les graines des Néuroptéridées. Ibid. 139: 23-27. 1904.

§ Zeiller, R. Observations au sujet du mode de fructification des Cycadofilicinées. Ibid. 138: 663-665. 1904.

|| Renault, B. Quelques remarques sur les cryptogames anciennes et les sols fossiles de végétation. Ibid. 138: 1237-1239. 1904.

¶ Benson, M. Ann. Bot. 18: 161-177. *Pl. 11.* 1904.

Lagenostoma and *Neuropteris*; among the Calamites we have *Stephanospermum*; and among the Lepidodendraceae we have the seed-like fructifications named *Lepidocarpou* by Professor Scott. Sufficient proof, it seems to me, that we had in the Paleozoic a great plexus of plants of a type transitional between the Pteridophyta and the Spermatophyta, from some of which the gymnosperms took their origin.

SHORTER NOTES

SOME INTRODUCED PLANTS IN CUBA.—It is well known that one of the most common methods for the distribution of weeds and various other plants from one locality to another is by means of seeds carried in food stuffs, bedding for animals, etc.

Recently while I was passing through the stable-yard of the Cuban Experiment Station, I discovered several plants of the common dandelion (*Taraxacum Taraxacum*). Following this discovery, in an investigation of the immediate vicinity, several other plants common to New York and other parts of the United States were found. Of the plants examined, numbering forty or fifty, some species were well represented, and with the exception of those growing in the coral-rock driveway, all were of recent growth, though normal in size. Inquiring at the stable as to the kinds of fodder used, I was shown several large sacks of oats, in which after a brief examination, many varieties of seeds, achenes and some dried fruits of common weeds were obtained. In former times large quantities of baled hay were used and this was scattered on the ground among the horses during the noon hour.

The following identified plants undoubtedly owe their occurrence to seeds that have either fallen directly from the hay to the ground, or perhaps more frequently have germinated from the excrement of the stock.

<i>Lepidium Virginicum</i> L.	<i>Plantago major</i> L.
<i>Trifolium repens</i> L.	<i>Plantago Rugelii</i> Decne.
<i>Trifolium pratense</i> L.	<i>Plantago lanceolata</i> L.
<i>Trifolium hybridum</i> L.	<i>Taraxacum Taraxacum</i> (L.) Karst.
	<i>Sonchus oleraceus</i> L.

PERCY WILSON.